P.O. Box 711
Tucson, Arizona 85702-0711



UniSource Energy SERVICES

June 13, 2011



Steve Olea
Director, Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Re: UNS Electric, Inc.'s Semi-Annual DSM Report
Docket No. E-04204A-06-0783, Decision No. 70360

Mr. Olea,

Pursuant to Decision No. 70360 (May 27, 2008) UNS Electric, Inc. ("UNS Electric") submitted its semi-annual Demand-Side Management ("DSM") program progress report on April 1, 2011.

On June 7, 2011, UNS Electric received final measurement, evaluation, and research ("MER") results for its 2010 Energy Efficiency Portfolio. The results show an increase in savings from those previously reported. For this reason UNS Electric is submitting a supplement that contains only the updated tables. UNS Electric also submits a copy of the MER report for 2010.

If you have any questions, please contact me at (520) 884-3680.

Sincerely,

Jessica Bryne

Jessica Bryne
Regulatory Services

Enclosures: Supplement Report and MER Report

cc: Docket Control, ACC
Julie McNeely-Kirwan, ACC

# UNS Electric, Inc.

## Supplement to Semi-Annual Demand-Side Management Programs Progress Report

July through December 2010

# UNS Electric, Inc.

SUPPLEMENT TO SEMI-ANNUAL DSM PROGRESS REPORT FOR THE PERIOD:
July through December 2010

In addition to the verified savings update, UNS Electric, Inc. ("UNS Electric") has also updated savings to reflect line losses of 10.69% for both kWh and KW savings.

The following charts replace the charts at the beginning of the 2010 Year-end Report. These charts reflect the savings as previously reported with the inclusion of line losses.

## Table 4

### DSM ENERGY SAVINGS: JANUARY – DECEMBER 2010

| Program | Capacity Savings MW | Annual MWh Savings | Annual Therm Savings | Lifetime MWh Savings | Lifetime Therm Savings |
|---|---|---|---|---|---|
| Low-Income Weatherization | 0.00 | 269 | 2,048 | 4,701 | 35,840 |
| Energy Smart Homes | 0.11 | 79 | 594 | 2,365 | 17,820 |
| Shade Tree | 0.01 | 38 | 0 | 1,138 | 0 |
| ENERGY STAR® Lighting (CFL) | 1.73 | 10,686 | 0 | 77,093 | 0 |
| Efficient Home Cooling | 0.10 | 195 | 0 | 2,918 | 0 |
| Commercial Facilities Efficiency | 0.69 | 3,337 | 0 | 48,018 | 0 |
| **Portfolio Totals** | **2.64** | **14,604** | **2,642** | **136,233** | **53,660** |

## Table 6

### DSM LIFETIME ENVIRONMENTAL SAVINGS: JANUARY – DECEMBER 2010

| Program | Lifetime $SO_X$ Reduction (lbs) | Lifetime $NO_X$ Reduction (lbs) | Lifetime $CO_2$ Reduction (lbs) | Lifetime Water Reduction (gallons) |
|---|---|---|---|---|
| Low-Income Weatherization | 26 | 559 | 6,017,371 | 1,217,617 |
| Energy Smart Homes | 13 | 281 | 2,814,353 | 612,536 |
| Shade Tree | 6 | 135 | 1,354,093 | 294,714 |
| ENERGY STAR® Lighting (CFL) | 424 | 9,174 | 91,741,112 | 19,967,183 |
| Efficient Home Cooling | 16 | 347 | 3,472,168 | 755,707 |
| Commercial Facilities Efficiency | 264 | 5,714 | 57,141,396 | 12,436,657 |
| **Portfolio Totals** | **749** | **16,212** | **162,540,493** | **35,284,415** |

# UNS Electric, Inc.

SUPPLEMENT TO SEMI-ANNUAL DSM PROGRESS REPORT FOR THE PERIOD:
July through December 2010

## Table 7

### DSM Savings & Expenses Since Program Inception: January 1992 – December 2010[1]

| PROGRAM | Start Date | Program Participants/Units | | Program Expenses | | MW Savings | | MWh Savings | | | Therm Savings | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Jan - Dec | Program Inception to Date | Jan - Dec | Program Inception to Date | Jan - Dec | Total Annual[a] | Jan - Dec | Total Annual[a] | Program Inception to Date[b] | Jan - Dec | Total Annual[a] | Program Inception to Date[b] |
| **Residential** | | | | | | | | | | | | | |
| Good Cents Homes | 1994 | 0 | 452 | $ - | $ 617,706 | 0.00 | 0.72 | 0 | 622 | 7,680 | N/A | N/A | N/A |
| Energy Smart Homes | 2007 | 99 | 135 | $ 151,154 | $ 496,772 | 0.11 | 0.22 | 79 | 143 | 236 | 594 | 2,345 | 5,689 |
| Shade Tree | 2008 | 155 | 395 | $ 21,536 | $ 53,075 | 0.01 | 0.01 | 38 | 95 | 153 | N/A | N/A | N/A |
| ENERGY STAR® Lighting (CFL) | 2008 | 172,100 | 343,208 | $ 323,644 | $ 636,553 | 1.73 | 3.06 | 10,686 | 18,538 | 26,389 | N/A | N/A | N/A |
| Efficient Home Cooling | 2008 | 483 | 931 | $ 197,085 | $ 355,104 | 0.10 | 0.25 | 195 | 642 | 1123 | N/A | N/A | N/A |
| **Commercial** | | | | | | | | | | | | | |
| Commercial Facilities Efficiency | 2008 | 38 | 91 | $ 445,935 | $ 881,256 | 0.69 | 1.49 | 3,337 | 6,510 | 9,682 | N/A | N/A | N/A |
| **Support Programs** | | | | | | | | | | | | | |
| Education & Outreach* | 1994 | 26,690 | 40,917 | $ 139,183 | $ 3,323,258 | 0.00 | 3.86 | 0 | 11,856 | 145,728 | N/A | N/A | N/A |
| Low-Income Weatherization | 1994 | 91 | 484 | $ 122,438 | $ 441,926 | 0.00 | 0.13 | 269 | 494 | 1435 | 2048 | 7671 | 22,017 |
| **Includes numbers previously reported separately under Residential and Commercial Energy Survey and Commercial New Construction.* | | | | | | | | | | | | | |
| Measurement, Evaluation & Research (MER) - all programs | NA | NA | NA | $ 241,282 | $ 506,574 | NA | NA | NA | NA | NA | NA | NA | NA |
| Baseline Study | 2009 | NA | NA | $ 142,067 | $ 148,720 | NA | NA | NA | NA | NA | NA | NA | NA |
| **TOTAL** | | **199,656** | **386,613** | **$1,784,322** | **$ 7,460,943** | **2.64** | **9.74** | **14,604** | **38,899** | **192,426** | **2,642** | **10,016** | **27,706** |

a. Accumulated savings for one year for all energy efficiency measures installed since program inception.
b. Accumulated savings for all years for all energy efficency measures installed since program inception.

[1] Historical DSM Program annual savings will decrease as the measure lifetimes expire. Programs with fully expired lifetimes will no longer be reported. Historical programs include Lighting, Motors, HVAC, and Energy Services for commercial participants, and Good Cents and Eff. Allowance for residential participants.

# UNS Electric, Inc.

## Measurement, Evaluation, and Research ("MER") Report

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# FINAL

# UNSE Demand Side Management 2010 Portfolio Savings Verification Report

## January 1, 2010-December 31, 2010

**Presented to:**
**UNS Electric**
**Randy Altergott and Denise Smith**

**June 7, 2011**

Presented by:

Floyd Keneipp
Navigant Consulting
1990 N. California Blvd, Suite 700
Walnut Creek, CA 94596

Phone 925.935.0270
Fax 925.935.0290
www.navigant.com

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## List of Tables

## Section 1. Summary

This report presents proposed changes and adjustments to the 2010 energy and demand savings calculations for the UNS Electric (UNSE) residential and commercial DSM programs after completing a savings verification review of reported savings.

Navigant Consulting reviewed the following files as provided by Randy Altergott which summarized preliminary 2010 savings for UNSE:

- 2010 EOY UNSE Residential Savings-Cost-Benefits-lookup.xls
- 2010 EOY UNSE Commercial Savings-Cost-Benefits-lookup.xlsx

For details on algorithms or assumptions, see the Navigant reviewed workbooks.

Overall, Navigant believes reported savings should be adjusted higher for demand (178% realization rate), higher for annual energy savings (145% realization), and slightly higher in lifetime energy savings (108% realization rate).

UNSE has reported values at meter. NCI presents values both at meter and at generator. A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter. The following algorithm is used to calculate at generator values:

*At generator = At meter value * (1+Line Loss Factor (LLF))*

Ex-Ante utility reported Capacity Savings (kW) were detailed as Non-coincident Demand Savings; however, Navigant reports these values as Coincident Demand Savings (including the Coincident Factor). This reduces the realization rate. The utility reported savings for the ES Lighting Program using the Coincidence Factor to calculate the reported Demand Savings; thus, the realization rate is not affected for this program.

Table 1-1, Table 1-2, and Table 1-3 present summary findings and adjustments for energy savings.

## Table 1-1. UNSE 2010 Portfolio Demand & Energy Savings Summary at Generator

| Program | Demand Savings (MW) | | | Annual Energy Savings (MWh) | | | Lifetime Energy Savings (MWh) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Reported Non-Coincident Demand @ Meter | NCI Verified Coincident Demand @ Generator*** | Realization Rate | Reported @ Meter | NCI Verified @ Generator*** | Realization Rate | Reported @ Meter | NCI Verified @ Generator *** | Realization Rate |
| ***UNSE Totals*** | ***1.48*** | ***2.64*** | ***178%*** | ***10,095*** | ***14,604*** | ***145%*** | ***126,393*** | ***136,233*** | ***108%*** |
| **Residential Programs** | | | | | | | | | |
| Low-Income Weatherization | - | - | - | 243 | 269 | 111% | 4,247 | 4,701 | 111% |
| Energy Smart Homes | 0.130 | 0.112 | 86% | 71 | 79 | 111% | 2,137 | 2,365 | 111% |
| Shade Tree | 0.010 | 0.009 | 89% | 34 | 38 | 111% | 1,028 | 1,138 | 111% |
| ENERGY STAR® Lighting (CFL) * ** | 0.680 | 1.732 | 255% | 6,919 | 10,686 | 154% | 69,186 | 77,093 | 111% |
| Efficient Home Cooling | 0.090 | 0.098 | 108% | 176 | 195 | 111% | 2,636 | 2,918 | 111% |
| **Commercial Facilities Efficiency**** | | | | | | | | | |
| AC-HP | 0.001 | 0.001 | 111% | 31 | 35 | 111% | 364 | 403 | 111% |
| Refrigeration | - | - | - | - | - | - | - | - | - |
| VSD's | - | - | - | - | - | - | - | - | - |
| Lighting | 0.57 | 0.69 | 120% | 2,502 | 3,171 | 127% | 44,652 | 45,243 | 101% |
| Custom | 0 | 0 | - | 119 | 132 | 111% | 2,142 | 2,371 | 111% |

** The ES Lighting Programs have used a Coincidence Factor to calculate the reported Demand Savings; therefore, these reported values are Coincident Deemed Savings at Meter.*

*** For the Energy Star Lighting (CFL) Program, 10% of CFL bulbs are assumed to be installed in commercial applications. Thus commercial factors are used to calculate savings for these bulbs.*

**** At generator values are calculated by the following algorithm: at meter * (1+LLF).*

***** Custom measure not yet verified.*

## Table 1-2. UNSE 2010 Portfolio Demand & Energy Savings Summary at Meter

| Program | Demand Savings (MW) | | | Annual Energy Savings (MWh) | | | Lifetime Energy Savings (MWh) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Reported Non-Coincident Demand @ Meter | NCI Verified Coincident Demand @ Meter | Realization Rate | Reported @ Meter | NCI Verified @ Meter | Realization Rate | Reported @ Meter | NCI Verified @ Meter | Realization Rate |
| ***UNSE Totals*** | ***1.5*** | ***2.4*** | ***161%*** | ***10,095*** | ***13,193*** | ***131%*** | ***126,393*** | ***123,076*** | ***97%*** |
| **Residential Programs** | | | | | | | | | |
| Low-Income Weatherization | - | - | - | 243 | 243 | 100% | 4,247 | 4,247 | 100% |
| Energy Smart Homes | 0.13 | 0.101 | 78% | 71 | 71 | 100% | 2,137 | 2,137 | 100% |
| Shade Tree | 0.01 | 0.008 | 78% | 34 | 34 | 100% | 1,028 | 1,028 | 100% |
| ENERGY STAR® Lighting (CFL)* | 0.68 | 1.565 | 230% | 6,919 | 9,654 | 140% | 69,186 | 69,648 | 101% |
| Efficient Home Cooling | 0.09 | 0.088 | 98% | 176 | 176 | 100% | 2,636 | 2,636 | 100% |
| **Commercial Facilities Efficiency**** | | | | | | | | | |
| AC-HP | 0.001 | 0.001 | 100% | 31 | 31 | 100% | 364 | 364 | 100% |
| Refrigeration | - | - | - | - | - | - | - | - | - |
| VSD's | - | - | - | - | - | - | - | - | - |
| Lighting | 0.570 | 0.619 | 109% | 2,502 | 2,865 | 115% | 44,652 | 40,874 | 92% |
| Custom | 0 | 0 | - | 119 | 119 | 100% | 2,142 | 2,142 | 100% |

**For the Energy Star Lighting (CFL) Program, 10% of CFL bulbs are assumed to be installed in commercial applications. Thus commercial factors are used to calculate savings for these bulbs.*

*** Custom measure not yet verified.*

**Table 1-3. UNSE 2010 Therm Savings Summary**

| Program | Annual Therm Savings | | | Lifetime Therm Savings | | |
|---|---|---|---|---|---|---|
| | UNSE Reported | NCI Verified* | Realization Rate | UNSE Reported | NCI Verified* | Realization Rate |
| ***UNSE Totals*** | ***2,642*** | ***2,642*** | ***100%*** | ***53,660*** | ***53,660*** | ***100%*** |
| **Residential Programs** | | | | | | |
| Low-Income Weatherization | 2,048 | 2,048 | 100% | 35,840 | 35,840 | 100% |
| Energy Smart Homes | 594 | 594 | 100% | 17,820 | 17,820 | 100% |
| Shade Tree | - | - | - | - | - | - |
| ENERGY STAR® Lighting (CFL) | - | - | - | - | - | - |
| Efficient Home Cooling | - | - | - | - | - | - |
| **Commercial Facilities Efficiency**** | | | | | | |
| AC-HP | - | - | - | - | - | - |
| Refrigeration | - | - | - | - | - | - |
| VSD's | - | - | - | - | - | - |
| Lighting | - | - | - | - | - | - |
| Custom | - | - | - | - | - | - |

The following sections present a summary of major findings of proposed changes and/or confirmation that no changes are required to reported savings.

## Section 2. Residential Programs

### 2.1 *Low Income Weatherization*

Savings are derived per AZ Energy Office. All deemed savings values are consistent with 2010 deemed savings values.

The Total kW column was re-titled "Total Non-Coincident Demand kW" and a new column was added "Total Coincident Demand kW" to include the coincidence factor.

There are no demand savings for this program, so the inclusion of the coincident factor does not change savings. A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter. Because demand is 0 kW, the realization rate is not affected by this change.

### 2.2 *Energy Star Homes*

The NTG ratio was changed from 0.95 to 1.00, which resulted in a slight increase in the BC ratio from 1.2 to 1.3.

Total KW column was re-titled "Total Non-Coincident Demand kW" and a new column ("Total Coincident Demand KW") was added which updates the algorithm with the coincidence factor.

A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter. This increases the realization rate.

### 2.3 *Shade Trees*

Savings per tree are derived per ACC Staff analysis from Decision No.70455 and need not be changed.

Total KW column was re-titled "Total Non-Coincident Demand kW" and a new column ("Total Coincident Demand KW") was added which updates the algorithm with the coincidence factor. Because the coincidence factor is 1.00, this change does not affect the realization rate.

A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter. This increases the realization rate.

### 2.4 *ENERGY STAR® Lighting (CFL)*

Navigant's review of the CFL program reported savings identified several areas in need of adjustment, which overall results in a proposed increase in program savings. Overall, Navigant advises that savings should be increased due to savings calculation corrections and other adjustments as detailed below.

The following is an itemization of identified issues and proposed corrections.

### 2.4.1 Line Loss Factor

A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter. This increases the realization rate.

### 2.4.2 Bulb Wattage Replacements

Bulb Wattage Replacements should be changed to reflect the values provided in the PY 2009 MER report. The deemed bulb wattage replacement values were first provided to UNSE in October, 2010 with an agreed upon expectation that these values would serve as the basis for 2010 deemed savings estimates. This change reduces savings. (See

Table 2-1 below).

**Table 2-1. Bulb Wattage Replacement Changes**

| Measure | Replacement | |
|---|---|---|
| | UNSE Reported | NCI Verified |
| 15W R30 | 75 | 65 |
| 15W R30 2pack | 75 | 65 |
| 20W R40 Dimmable | 75 | 85 |
| 23W R40 2-pack | 100 | 120 |

### 2.4.3 Commercial Adjustment

**Based on evaluations from California[1], Illinois[2] and Vermont[3], it is estimated that 10% of bulbs purchased go into commercial applications (small businesses).**

Table 2-2 presents the different factors that are used for residential and commercial customers respectively in the analysis. This change significantly increases savings, and could be considered for TEP 2010 results, as well as incorporation into the savings estimation for 2011.

---

[1] The CPUC's evaluation of the Statewide Upstream Lighting used store intercepts and on-site visits to estimate the percent of bulbs which go into nonresidential settings. Their findings yielded a 94%/6% residential/nonresidential split. Source: **Final Evaluation Report: Upstream Lighting Program**, *Volume 1*. KEMA. 2010. http://www.energydataweb.com/cpucFiles/18/FinalUpstreamLightingEvaluationReport_2.pdf

[2] ComEd's Plan Year 2 Residential ES Lighting program evaluation uses a 90%/10% residential/nonresidential split. Source: **Energy Efficiency/ Demand Response Plan: Plan Year 2 (6/1/2009-5/31/2010)** – *Evaluation Report: Residential Energy Star® Lighting*. Navigant Consulting, Inc. December, 2010. http://ilsag.org/yahoo_site_admin/assets/docs/ComEd_Res_Lighting_PY2_Evaluation_Report_2010-12-21_Final.12113928.pdf

[3] "Vermont assumes currently that 10.5% of CFLs rebated via the buy-down program are installed in commercial facilities." Source: Personal communication. TJ Poor, Energy Programs Specialist. Vermont Department of Public Service. March 23, 2010."

Note- this adjustment is not currently reflected in 2011 deemed savings estimates, however, we propose to add this factor retro-active to January 1, 2011, and would need to discuss how best to inform the ACC of this proposed change in savings.

**Table 2-2. Residential and Commercial Factors**

| Factors | Residential | Commercial |
|---|---|---|
| Ratio of Bulbs Sold | 0.9 | 0.1 |
| Operation Hours: | 852 | 4,098 |
| HVAC interaction Energy Factor: | 0.11 | 0.14 |
| HVAC interaction Demand Factor: | 0.35 | 0.26 |
| Coincidence Factor: | 0.08 | 0.93 |
| *Measure Life (years):* | | |
| 8000 hr rated bulb | 10 | 1.95 |
| 10000 hr rated bulb | 10 | 2.44 |
| 12000 hr rated bulb | 10 | 2.93 |

The commercial adjustment requires some changes in the analysis. These steps are discussed below.

- Two new columns were added:
  - Commercial kWh. The formula for this column is:
    *KW * NTG * Install Rate * Customer Rate * Operation Hours * (1+Commercial energy interaction factor) = KW * 1.00 * 0.9 * 0.96 * 4098 *1.14*

  - Commercial Measure Life: This factor is calculated by dividing the Actual life hours (manufacturer reported measure life) by the operation hours.

- Total KW column formula was re-titled to "Total Coincident Demand KW".
  - The "Total Coincident Demand KW" formula was updated to include the following factors:
    - Install Rate = 90%
    - Customer Rate (Leakage) = (100-4%)
    - Residential Demand Interaction Factor = 0.35
    - Commercial Demand Interaction Factor = 0.26
    - Commercial KW
    - Commercial Coincidence Factor

Original Equation:

*KW * Number Installed * Coincidence Factor*

Updated Equation:

*(KW * Number Installed * res Coincidence Factor * Install Rate * Customer Rate * (1+residential Demand Interaction Factor) * res ratio) +*
*(KW * Number Installed * comm. Coincidence Factor * Install Rate * Customer Rate * (1+Commercial Demand Interaction Factor) * comm. ratio) =*

*(KW * # * 0.08 * 0.9 * 0.96 * 1.35 *0.9) +*
*( KW * # * 0.93 * 0.9 * 0.96 * 1.26 * 0.1)*

- New column, "Total Non-Coincident Demand KW" column was added. This column contains the same formula as the "Total Coincident Demand KW" column, except it does not include the residential and commercial coincidence factors.

*((KW * Number Installed * Install Rate * Customer Rate * (1+Residential Demand Interaction Factor) * Res. Ratio) +*
*(KW * Number Installed * Install Rate * Customer Rate * (1+Commercial Demand Interaction Factor) * Comm. Ratio)) =*

*(KW * # * 0.9 * 0.96 * 1.35 *0.9) +*
*( KW * # * 0.9 * 0.96 * 1.26 * 0.1)*

- The annual kWh algorithm changed to reflect commercial bulbs.
  Updated equation:

*((RES on-peak kWh + RES off-peak kWh) * Res ratio [0.9]) + (commercial annual kWh * comm. Ratio [0.1])) * # of bulbs*

- The lifetime MWh algorithm changed to reflect commercial bulbs.
  Updated equation:

*((RES on-peak kWh + RES off-peak kWh) * Res ratio [0.9] * res Measure Life) +*
*(commercial annual kWh * comm. Ratio [0.1] * comm. Measure life)) * # of bulbs /1000*

### 2.4.4 HVAC Interaction Factors (Demand and Energy)

HVAC interaction factors should be used for both the demand and energy calculation. There are different residential and commercial factors.

- Residential Demand: 0.35
- Residential Energy: 0.11
- Commercial Demand: 0.26
- Commercial Energy: 0.14

The updated equation above for total KW includes these factors.
As for Annual Energy, because "On-Peak and Off-Peak (kWh) Annual" already includes the HVAC energy interaction factor, the line adding a 5kWh/lamp indirect cooling savings to the total annual savings should be deleted. This row double counts the credit.

The changes in the CFL program savings methodology resulted in substantial increase in savings, largely due to the 10% commercial adjustment: a 258% realization rate for demand savings, a 156% realization rate for energy savings, and a 113% realization rate for lifetime energy savings for the UNSE 2010 CFL Program at the Generator.

### 2.5 *Efficient Home Cooling*

All savings values and calculations are consistent with 2010 deemed savings values.

Total KW column was re-titled to "Total Non-Coincident Demand KW" and a new column was added, which multiplies the non-coincident demand KW with the Coincidence Factor. This new column is titled "Total Coincident Demand KW". This reduces the realization rate slightly.

A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter. This increases the realization rate.

### 2.6 *Residential Summary*

Overall, Navigant's savings verification of UNSE's residential programs resulted in realization rates of 214% for demand savings, 151% for annual electric energy savings, 111% for lifetime electric energy savings, 100% for annual therm savings, and 100% for lifetime therm savings at the Generator.

Table 2-3 below presents Reported at Meter (as provided by UNSE to Navigant for review) and Verified Savings at Generator (adjusted savings post Navigant review accounted for Line Loss, and for demand savings, coincidence factor), as well as the Realization Rate (Verified Savings/Reported Savings).

**Table 2-3. Reported and Verified Savings and Realization Rate for Residential Programs**

| | Coincident* Demand Savings (MW) | Annual Energy Savings (MWh) | Annual Therm Savings | Lifetime Energy Savings | Lifetime Therm Savings |
|---|---|---|---|---|---|
| Reported (@ meter for energy) | 0.91 | 7,443 | 2,642 | 79,234 | 53,660 |
| Verified (@ generator for energy) | 1.95 | 11,266 | 2,642 | 88,215 | 53,660 |

| | | | | | |
|---|---|---|---|---|---|
| Realization Rate | 214% | 151% | 100% | 111% | 100% |

## Section 3. Commercial Facilities Efficiency Program

### 3.1 *Air Conditioning and Heat Pumps*

A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter resulting in an energy and demand realization rate of 111%.

### 3.2 *Refrigeration*

No reported savings.

### 3.3 *Variable Speed Drives (VSD)*

No reported savings.

### 3.4 *Lighting*

Navigant's review of the Commercial Lighting program reported savings identified several areas in need of adjustment, which overall results in an increase in annual energy savings with a 127% realization rate.

Navigant reviewed the implementation contractor's reported hours of operation for lighting measures per building type. In comparing the weighted averages of the reported hours of operation for lighting to three different reports (UNS 2010 Baseline Report, DEER 2008, and an Internal Study), it was found that the hours of operation reported by the implementation contractor were within a reasonable range (4% higher) of the combined weighted average of three comparison studies. As such, Navigant believes the currently reported hours of operation are appropriate for 2010 savings verification. However, Navigant does recommend that MER field metering be conducted in the future to help improve the confidence of reported versus actual hours of operation.

Table 3-1 presents Reported and Verified Savings, as well as the Realization Rate for the C&I Lighting

**Table 3-1. Reported and Verified Savings and Realization Rate for C&I Lighting**

| | Coincident* Demand Savings (MW) | Annual Energy Savings (MWh) | Lifetime Energy Savings (MW) | Annual Therm Savings | Lifetime Therm Savings |
|---|---|---|---|---|---|
| Reported (@ meter for energy) | 0.57 | 2,502 | 44,652 | - | - |
| Verified (@ generator for energy) | 0.69 | 3,171 | 45,243 | - | - |
| Realization Rate | 120% | 127% | 101% | - | - |

- The reported measure lives were based on a previous version of MAS. NCI has adjusted the measure lives to represent the 2010 deemed values.

- A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter.

- NCI has included HVAC Interactive factors (HIF) in the calculation of demand and energy savings. Through the installation of efficient lighting measures, there is an inherent decrease in the HVAC cooling load, effectively increasing the savings attributed to lighting measures. The incorporation of HIF and LLF increased the demand savings by 20% and the energy savings by 27%.

- On-Peak and Off-Peak kWh equations were updated to include the following factors:
  - Energy Interaction Factor = 0.14 for CFLs
    0.23 for linear fluorescent lighting (LFL)
    0.17 for Exit Signs

  *Original Equation: KW * Number Installed *Op Hours (On-Peak or Off-Peak)*
  *Updated Equation: KW * Number Installed * Op Hours * (1+Energy Interaction Factor)*

- Total KW equation was updated to include the following factors:
  - Demand Interaction Factor = 0.25 for CFLs
    0.14 for linear fluorescent lighting (LFL)
    0.36 for Exit Signs
  - Coincidence Factor = 0.93 for CFLs and LFL
    1.00 for Exit Signs

  *Original Equation: KW * Number Installed*

*Updated Equation: KW * Number Installed * Coincidence Factor * (1+Demand Interaction Factor)*

These changes resulted in a 20% increase in total MW, 27% increase in Annual MWh and a increase of 1% for lifetime MWh.

### *3.5 Custom*

A line-loss factor (LLF) of 10.69% was applied to the demand and energy savings to account for transmission and distribution losses from generator to meter resulting in an energy realization rate of 111%.